



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

While there is no formal index, the orderly arrangement of the material, the detailed table of contents, and the very thorough cross-indexing of tables and discussions make it easy for one acquainted with the general make-up of the volume to use it for a reference manual. The study will be welcomed by educators, physicians, anthropologists, hygienists, and social workers as a most comprehensive, convenient, and practically useful summary of, and addition to, the literature of child development.

F. A. KINGSBURY

UNIVERSITY OF CHICAGO

---

*Experimental studies in efficiency.*—Various studies of the achievement of individuals working under specified conditions have directly or indirectly contributed evidence to the effect that one's physical and mental abilities are inconstant in amount or degree, and are apparently not only sensitive to those external influences, such as temperature, light, and humidity, which may be felt as stimuli, but also affected by seasons and by the time of day. A brief summary of the important studies of this type is included in a recent volume<sup>1</sup> which presents similar data from the author's study of two groups of pupils in the Manual Training High School of Washington University during the school year 1910-11.

The discussion of variations in efficiency is organized under the four general headings of seasonal, diurnal, and other periodic variations, and weather influences. In each case there is presented a very brief summary and a critical evaluation of other studies relating to the topic, following which is the description of the tests and method employed in the author's own study.

While a large number of pupils took some of the tests, there were only ten who took the tests daily from October, 1910, to June, 1911. Another group of twenty-two pupils took the tests once each week during the same period. The physical test employed was one for strength of grip, the Smedley dynamometer being used. The mental test was for primary memory; a series of two-place numbers read by the instructor at the rate of one per second was to be reproduced by the student within fifteen seconds after the reading. At the time of each test, and as a part of the record for that test, the date, the time of day, and the character of the day were noted. Apparently, due care was exercised both in giving the tests and in recording the scores. In addition to the general tables of daily and weekly scores, the data are tabulated to show variations in the average achievements of each group by months and by weeks for the period of testing. Comparisons are also made between the variations in physical and in mental efficiency from month to month for the two groups. The text includes an analytical study of the tabular data, the inferences being, in the main, fairly drawn.

<sup>1</sup> ARCHIBALD G. PEAKS, *Periodic Variations in Efficiency*. Baltimore: Warwick & York, 1921. Pp. 95.

Among the conclusions arrived at as a result of the study, the author finds in the data assembled definite evidence of periodic variations both of the seasonal and of the diurnal type in mental as well as in physical energy. He summarizes his observations with reference to these types of changes in the following paragraphs from the chapter entitled "Summary and Suggestions."

There are three distinct periods in the physical strength of growing boys in the course of a school year, a period of growth from September to about the middle of December, a period of depression from January to March, and a period of renewed growth from March to June.

There are also three more-or-less distinct periods in mental energy during the school year, the curve of which tends to resemble the curve for physical periodicity in the same group of subjects; first, a favorable period from September to the end of the year, an unfavorable period from January to March, and a second favorable period from March to May.

The depression in mental abilities seems to appear somewhat after the depression in physical strength, is much less noticeable, and does not last so long.

The period of depression in mental and physical abilities comes at the beginning of winter, and while it shows many individual variations, it occurs in all subjects studied and lasts from three to six weeks. Adults and boys of low vitality tend to show it early in December. Young and growing boys show it any time between the first of December and the middle of January. In some subjects the effects are overcome by the middle of February, in others by March, but in special cases it sometimes lasts until May.

There is a distinct diurnal course of efficiency shown in both the mental and physical tests. Both increase quickly through the forenoon, each shows a slight decrease around noon, and both come to a maximum in the afternoon. That for mental abilities culminates at 2 P.M., while that for physical abilities often comes later in the afternoon [pp. 91-92].

Numerous observations concerning weather effects and other causal factors are included, and suggestions offered relating to the need for further investigation of the problem.

An additional chapter is entitled "Critical Review of Experimental Methods in Investigating Periodicity." The content of the nine pages included does not, however, justify the chapter title, since little is presented more than specific statements tending to establish the validity of the procedure followed by the author himself. Even as a review of his own methods of investigation, the discussion can in no sense be called critical. It contributes materially to the value of the report of the author's own study in that many significant details relating to both materials and methods not described elsewhere are here fully stated. The objection raised is therefore not against the inclusion of this chapter as a part of the report—the study would be distinctly less complete and less valuable without it—but rather to the extravagant claim which its title implies.

Those interested in the phases of educational psychology of which the study treats will find its content valuable and suggestive because of the character

of the material assembled from other investigations, as well as for the data reported from the tests given by the author himself.

---

*The preparation of test material.*—A new series of diagnostic tests<sup>1</sup> for the fundamentals of first-year algebra differs in certain important features from the standardized scales now in use. The fundamentals for which these tests were constructed were determined by means of a questionnaire sent to college and secondary-school instructors. From the results of the tabulation, the four processes most frequently reported were selected for the tests designated as Series A. The fundamentals thus determined were (1) collection of terms, (2) multiplication, (3) division, and (4) solution of the simple equation.

In selecting test material the writer adapted certain problems from the better texts. These exercises involve different combinations of steps in each process and represent various degrees of difficulty, thus giving opportunity for diagnosis and at the same time for differentiation of degrees of ability. Mr. Douglass says that "it is in this arrangement that the tests under discussion have a distinct and important advantage over other tests for measuring algebraic ability or progress" (p. 13). An examination of the tests shows a greater variety of types of exercises than in those scales which he criticizes on this point, but it is apparent that one or two problems of a particular type are not a sufficient basis for a careful diagnosis. For example, the failure of a pupil on problem 4 of test 1, would not necessarily mean that he was weak in this particular type of subtraction. If he failed on several similar problems, the certainty of his weakness would be more apparent. The cycle principle of test design provides for this difficulty and if used in a modified form would improve these tests for diagnostic purposes.

The test material was arranged in approximate order of difficulty and given under time-limits which were thought sufficient except for the very slow pupils. From the results of about one thousand returns each problem was given a weighted value according to the proportion-of-pupils-solving method. Tentative standards and P. E. values for the problems were then obtained. Inspection of these P. E. values shows that they increase as the problems become more complex in each test, but that the differences are relatively slight. The fractional values, moreover, are very tedious to handle. Recent testing-results suggest that weights of this type are of doubtful value. For a fair-sized class the correlations between weighted scores and scores obtained by giving each problem the value 1 often run higher than .99. The argument that an individual score is more accurately obtained by weighted values is again open to question until the probable errors (as a measure of reliability) of such scores are obtained and comparisons made. The same considerations apply to the

<sup>1</sup> HARL ROY DOUGLASS, *The Derivation and Standardization of a Series of Diagnostic Tests for the Fundamentals of First Year Algebra*. "University of Oregon Publications," Vol. I, No. 8. Eugene, Oregon: University of Oregon Press, 1921. Pp. 48.